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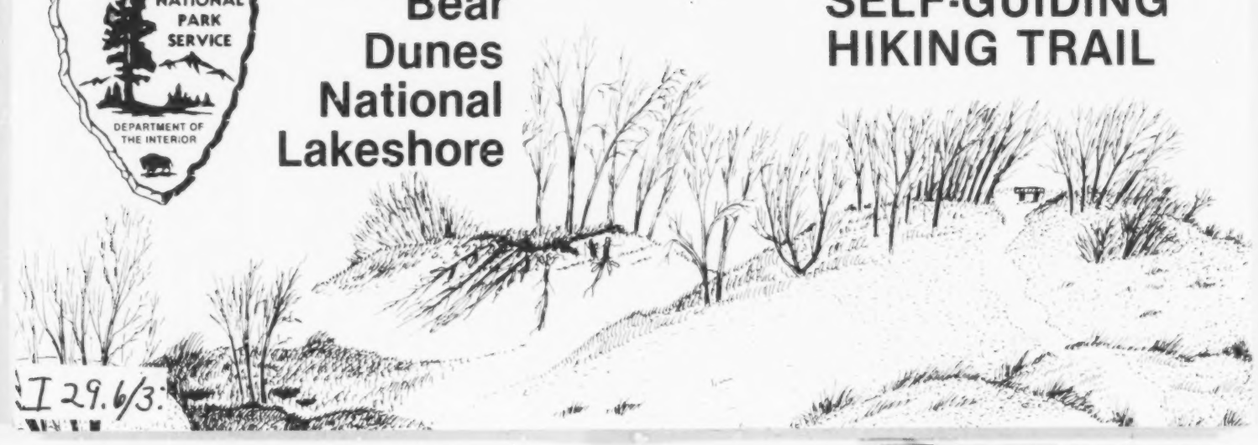
NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR

Sleeping Bear Dunes National Lakeshore

COTTONWOOD SELF-GUIDING HIKING TRAIL



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Welcome to the Cottonwood Trail. Allow about an hour to walk this 1½ mile loop.

The numbers in this folder refer to numbered markers along the trail.

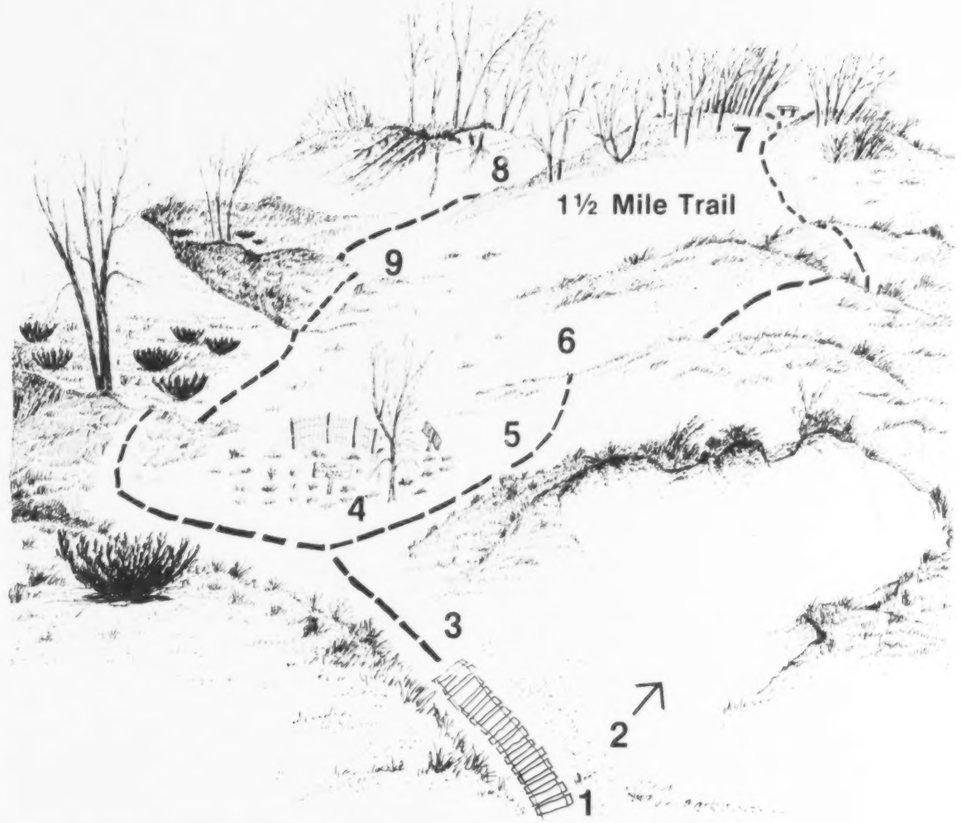
At #7 you will find benches where you can relax and enjoy the view of Glen Lake.

The dunes are an ever-changing landscape. If we could view a time-lapse movie of the dunes, we would see dunes growing and advancing across the land; we would see plants taking root and holding the dunes in place; and we would see wind action eroding the dunes, leaving behind irregular, broken surfaces. As you walk along the Cottonwood Trail, you will have a chance to see all of this, captured for a moment in time.

Poison Ivy

1. WATCH OUT FOR POISON IVY ALONG THE BEGINNING OF THE TRAIL

You can develop a rash from touching the plant itself, or even from touching your shoes or pants after walking through a patch of poison ivy.



2. THE BLOWOUT

Notice the bowl-like shape of the dune up ahead, to the right of the trail. It is called a blowout. Erosion by prevailing southwesterly winds formed this blowout.

Originally, the windblown sand was in the shape of an ordinary hill or mound. Gradually grasses grew on the hill and held the sand in place. Later, wind erosion removed sand on the windward side of the dune. Notice that a cover of grasses remains on the portions of the dune protected from the wind.

3. THE OLD ROAD

White Sweet Clover

The clay and gravel surface of this old road is quite different from the pure sand of the dunes. The roadside wildflowers include white sweet clover, spotted knapweed and Queen Anne's lace. These are not native American plants; they originally came from Europe.

Alien plants frequently take over disturbed locations like roadsides and old farm fields. The different soil along this road probably helped to give the alien plants an advantage over the native flora.

Spotted Knapweed

This old road is actually an abandoned loop of the Pierce Stocking Scenic Drive. As you walk along, you will discover why the road is no longer maintained: sand has buried it to a depth of several feet in some places.

Queen Anne's Lace

4. DUNE RESTORATION STUDY AREA

The dunes are a fragile environment. Hikers can quickly damage the plant life, leaving paths that take years to revegetate.

The Dune Restoration Study Area was set up in 1984 to study various methods of restoring native plants to damaged dunes. Among the methods tried were planting of beachgrass, adding fertilizer to the sand and setting up a snow fence to trap sand. In the future, some of these methods may be used to restore eroded dune areas.

5. SAND

Pick up a handful of sand and study it closely. Notice that all the grains are just about the same size: small enough to blow about in the wind, but heavy enough to come to rest abruptly when the wind stops blowing.

The grains of sand are not all the same color. Several different minerals are present. Quartz is the most common, and appears either clear or rusty in color, from a coating of iron oxide. Quartz is very resistant to breaking down chemically or physically. Other colors in the sand represent different minerals present in minor amounts. The grains of sand come from the breakdown of larger rocks.

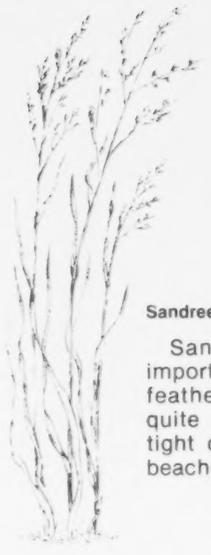
Did you notice anything about the shape of the grains of sand? Dune sand is typically well-rounded and shows a frosted surface from contact with other grains of sand.

6. GRASSES AND FLOWERS OF THE DUNES

Quite a variety of grasses and wildflowers live on the sand dunes. Look over the illustrations and see if you can recognize some of these plants as you walk along the trail.

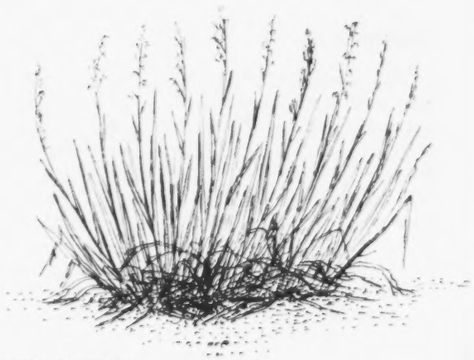
Beachgrass

Beachgrass is one of the first plants to grow on a newly-formed dune. Its roots form a dense network that helps to hold the sand in place. When sand piles up around its base, beachgrass can grow rapidly to avoid being buried.



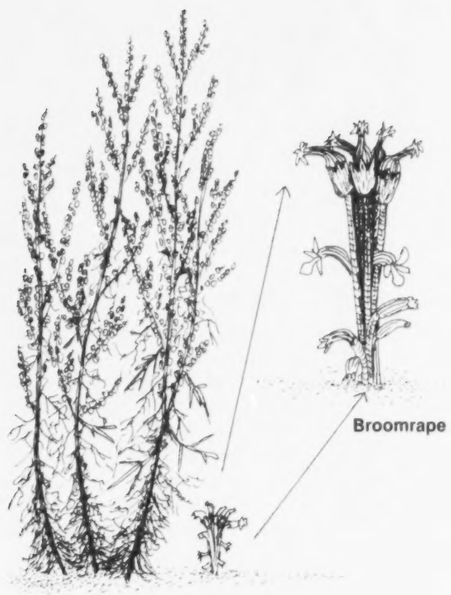
Sandreed

Sandreed is another important sand binder. The feathery seedheads are quite different from the tight clusters of seeds in beachgrass.



Little Bluestem

Little bluestem grows on stabilized dunes. It is a bunchgrass, forming distinct clumps rather than a continuous cover. It is not as well suited to preventing erosion as beachgrass.



Wormwood

Wormwood belongs to the same genus as Western sagebrush. The flowers, blooming July through October, are wind-pollinated. They are not showy, for there is no need to attract insects for pollination. Perhaps you will see a small, brownish plant growing at the base of the wormwood. This is the broomrape, a Michigan protected wildflower, because of its rarity. Lacking chlorophyll for manufacturing its food, the broomrape live as a parasite on the wormwood.

Beach pea blooms in July and August. The bright pink flowers resemble the garden sweet pea. Like other members of the legume family, the beach pea is a nitrogen fixer, improving the soil for other plants.

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Beach Pea

7. VIEW FROM THE BENCHES

From here you can survey the dunes, Glen Lake and the surrounding countryside. The dune climb below, where thousands of people climb each year, lies along the eastern edge of the dunes. The sand advances there at a rate of about four feet per year.

If you stop at the Dune Climb later, look for the exhibit on sand movement. In 1985, a horizontal beam was placed at the edge of the dunes. It allows you to measure how many feet the dune has advanced over the years. The exhibit is located just north of the main climbing area.

Actually the rate of movement of these dunes is minor compared to some desert dunes. The wind loses its ability to move sand beyond a mile or so from Lake Michigan, and plants also help to stabilize the dunes and limit sand movement.

8. AN ACTIVE DUNE

The cottonwood trees on this dune tell the story of change. Some of the trees are being buried in sand, while others have had their roots exposed where the sand has blown away. You can follow some of the runners along the surface of the dune to places where new trees have sprouted.

Feel a leaf of the cottonwood tree. How would you describe it? Maybe waxy or like plastic? This type of leaf is found among many different plants in dry locations. The waxy surface slows down water loss through the leaves.

The sand dunes are not a desert; they receive about 30 inches of rainfall per year. However, the dunes are somewhat drier than the neighboring forests because of strong sunlight, wind and the lack of a moisture-holding layer of humus. Water filters through sand more quickly than through soils that have some silt and clay. Therefore dune plants have some of the same adaptations as desert plants.

9. SHRUBS OF THE DUNES

As you walk along this section of trail, look for some of the typical shrubs of stabilized dunes. Try to spot a paper birch, a small tree with white bark. This is one of the few places on the dunes where it grows.

Why is the plant community here so different from the one you saw earlier along the trail? Perhaps this location is more sheltered from the wind; or maybe the under lying glacial deposits (which provide more moisture and nutrients) are closer to the surface.

Common Juniper

Common juniper is an evergreen shrub that occurs in two forms, an upright form several feet tall and a low ground cover.

Bearberry

Bearberry forms a low ground cover. It is a broad-leaved evergreen with tiny, pink flowers in the spring and a red berry in late summer and fall.

Buffaloberry

Buffaloberry stands 3 to 5 feet high and has small clusters of orange berries. The shrub contributes nitrogen to the soil through bacteria that live on its roots.

Sand Cherry

Sand cherry is a small shrub with white flowers in the spring and blackish cherries in late summer. A black fungus growing on the twigs is an aid in identification.

We hope you have enjoyed your walk on the Cottonwood Trail. There are other trails within Sleeping Bear Dunes National Lakeshore, both on the sand dunes and through wooded areas. Please feel free to stop at the Visitor Center in Empire to pick up trail maps and get more information about the park.